

## CLAIMS

I claim:

1. A process for removing thiothionylfluoride from a composition containing sulfur tetrafluoride and an initial concentration of thiothionylfluoride, said process comprising:  
5 contacting said composition with an activated carbon;  
reacting at least a portion of said thiothionylfluoride to form elemental sulfur; and  
recovering a purified composition containing said sulfur tetrafluoride and said thiothionylfluoride at a reduced concentration less than said initial concentration.
- 10 2. The process of claim 1, wherein said activated carbon has a surface area of about 800 to about 1000 m<sup>2</sup>/g.
3. The process of claim 2, wherein said activated carbon has less oxygen-containing active sites than Westvaco activated carbon.
4. The process of claim 1, wherein said activated carbon is free of metal oxides.
- 15 5. The process of claim 1, wherein said contacting comprises loading said composition on a bed of said activated carbon in a column.
6. The process of claim 1, wherein a maximum of 800 grams of said activated carbon are provided per mole of said thiothionylfluoride being reacted.
7. The process of claim 1, wherein said recovering comprises monitoring signals  
20 emitted from an effluent flowing from a bed of said activated carbon and collecting said purified composition as a fraction of said effluent emitting said signals indicative of said sulfur tetrafluoride and contraindicative of said thiothionylfluoride.
8. The process of claim 7, wherein said signals are monitored by ultraviolet spectroscopy and infrared spectroscopy.
- 25 9. The process of claim 1, wherein said initial concentration of thiothionylfluoride is at least 8% v/v.
10. The process of claim 1, wherein said reduced concentration is 0 to 0.3% v/v.

11. The process of claim 1, wherein said purified composition is free of thiothionylfluoride.

12. The process of claim 1, further comprising activating said activated carbon prior to said contacting by heating a carbonaceous material to at least 150°C under an inert gas atmosphere for at least 8 hours and cooling to room temperature.

13. The process of claim 1, further comprising replenishing said activated carbon from which said purified composition is obtained by contacting said activated carbon with a gas mixture containing oxygen and nitrogen to convert elemental sulfur adsorbed on said activated carbon to sulfur dioxide without oxidation of said activated carbon.

14. The process of claim 13, wherein said gas mixture is air.

15. The process of claim 14, wherein said air is provided at a temperature of 250-300°C and an airflow rate is provided so as to maintain an oxidation rate such that a reaction zone temperature does not exceed 400°C.

16. The process of claim 15, wherein said oxidation rate is 9-1000 µg/min.

17. The process of claim 1, further comprising replenishing said activated carbon from which said purified composition is obtained by replacing said activated carbon with fresh activated carbon.

18. A process for removing thiothionylfluoride from a composition containing sulfur tetrafluoride and an initial concentration of thiothionylfluoride, said process comprising:

contacting said composition with a material having a surface area of at least 400 m<sup>2</sup>/g, wherein said material is free of metal oxides;

reacting at least a portion of said thiothionylfluoride to form elemental sulfur; and

recovering a purified composition containing said sulfur tetrafluoride and said thiothionylfluoride at a reduced concentration less than said initial concentration.

19. The process of claim 18, wherein said material is activated carbon.